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# (54) Optical fibres

(57) In order to achieve curing of u.v. curable primary coating material applied to an optical fibre, such as directly after pulling from a preform, the output from a u.v. laser is directed axially into the preform and stripped from the fibre at the point of application of the primary coating material, which stripped radiation thus causes curing.

Fig.1.

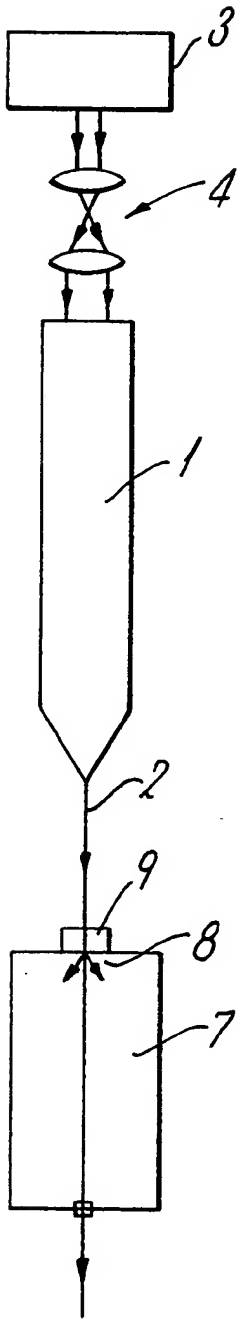
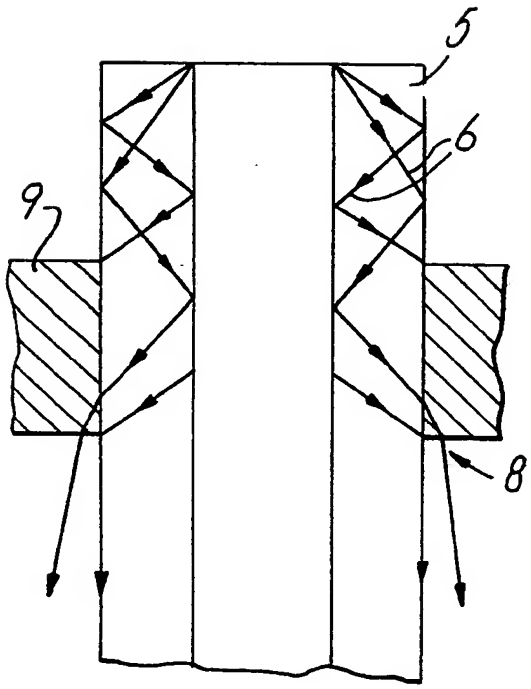



Fig.2.



SPECIFICATION

**Optical Fibres**

This invention relates to optical fibres and in particular to the curing of primary coatings applied to optical fibres.

Primary coatings are applied to optical fibres directly after their manufacture, which generally involves pulling from a preform. The primary coating materials employed may be heat or u.v. light curable and may be applied in various ways, for example extrusion or solution coating. U.V. light curing currently involves passing the just-coated fibre through the beam of one or more u.v. lamps in order that sufficient u.v. light to cause curing is incident on the coated fibre, the speed of fibre drawing and coating also being relevant factors.

According to the present invention there is provided a method of curing u.v. curable primary coating material applied to an optical fibre including the steps of directing u.v. radiation axially into the fibre and stripping it from the fibre at the point of application of the primary coating material.

Embodiments of the invention will now be described with reference to the accompanying drawings, in which:

Fig. 1 illustrates, schematically, u.v. curing in-line with fibre drawing and coating, and

Fig. 2 illustrates a detail of Fig. 1 on an enlarged scale.

Instead of passing a primary coated optical fibre through the beam of a u.v. lamp in order to cure a u.v. curable primary coating, the present proposal involves directing u.v. radiation axially into a preform 1 from which a fibre 2 is being drawn in a conventional manner.

As illustrated in Fig. 1, the output from an ultra-violet laser 3, for example an Excimer laser or a He-Cd laser, is directed axially into the preform 1 via a beam expander 4. The u.v. light propagates in the cladding 5 of the preform, two cladding modes 6 being shown in Fig. 2. When the primary coating material is applied, as illustrated schematically at 7 and for example by dip coating the u.v. radiation cladding modes are stripped from the cladding at the point of application 8 of the liquid primary coating material and thus curing is achieved. Provided the refractive index of the coating material is greater than the refractive index of the cladding the coating material will itself strip the cladding modes therefrom. If this is not the case then a glass bead 9 whose refractive index is greater than the refractive index of the cladding material may be disposed just prior to the point of application 8 of the primary coatings, with the fibre passing therethrough in order to achieve the cladding mode stripping. The bead 9 may even be just immersed in the liquid coating material to ensure maximum effectiveness of the mode stripping.

Using such an in-line method of application of u.v. radiation means that there will be uniform illumination at the point of curing. Curing will also be rapid since the power applied is much higher than can be achieved with lamps.

CLAIMS

1. A method of curing u.v. curable primary coating material applied to an optical fibre including the steps of directing u.v. radiation axially into the fibre and stripping it from the fibre at the point of application of the primary coating material.

2. A method as claimed in claim 1 wherein the coating material is applied to the optical fibre directly after pulling thereof from one end of an optical fibre preform, the u.v. radiation being directed axially into the other end of the preform.

3. A method as claimed in claim 1 or claim 2 wherein the u.v. radiation is stripped from a cladding layer of the fibre.

4. A method as claimed in claim 3 wherein the u.v. radiation is stripped from the cladding layer by a bead of higher refractive index than the cladding layer and through which the fibre is passed.

5. A method as claimed in any one of the preceding claims wherein the u.v. radiation is provided by a u.v. laser.

6. A method of curing u.v. curable primary coating material applied to an optical fibre substantially as herein described with reference to the accompanying drawings.

7. An optical fibre having a u.v. cured primary coating cured by a method as claimed in any one of the preceding claims.

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